Scientific Museum.

New Respirator—Proof Against Infection, &c.

The following is a description of a new Charcoal Respirator, by J. Stenhouse, F. R. S., the author of the paper on the disinfecting properties of charcoal, which appeared in our columns last week; this description is taken from the same publication—the London "Journal of the Society of Arts:"—

"The object of the present paper is chiefly an application of the absorbent and oxydizing properties of charcoal, which, so far as I am aware, has never yet been proposed, viz. to employ a new species of respirator, filled with powdered animal charcoal, to absorb and destroy any miasmata or infectious particles present in the air in fever and cholera hospitals, and districts infected by ague, yellow fever and similar diseases. I have got such a respirator, made by Ferguson & Sons, Smithfield, instrument-makers to St. Bartholomew's Hospital. It fits closely to the lower portion of the face, extending from the chin to within half an inch of the eyes, and projects about an inch on either side of the mouth. It therefore includes the nostrils as well as the mouth. The frame of the respirator is made of thin sheet copper, but the edges are formed of lead, and are padded and lined with velvet, so that it can be easily made to fit tightly to the face. The powdered charcoal is kept in its place by means of two sheets of fine wire gauze, from a quarter to an eighth of an inch apart.—As the body of the appartus is metallic, it has been electro-plated with silver. Electro-plating the respirator with platinum or gold would certainly be an improvement. There is a small opening closed with a wire-gauze screw, by means of which the respirator can be filled with charcoal or emptied at pleasure. The respirator is kept in its place by an elastic band passing round the back part of the head. I employ wood-charcoal. The object in view is, by filtering the air with such a porous substance as animal charcoal, to intercept the miasmata which may have got mixed with it. These, I think, cannot fail to be absorbed by the pores of the charcoal, where they will be rapidly oxydated and destroyed by the condensed oxygen with which they will be brought into the most intimate contact. The probability of this expectation being realized is greatly strengthened by the results of repeated trials with the respirator on certain noxious and offensive gases, such as ammonia, sulphuretted hydrogen, hydrosulphate of ammonia and chlorine. I have found that air strongly impregnated with these gases, and which could not be respired for any length of time under ordinary circumstances, may be breathed with impunity when the charcoal respirator is worn, the odor of these gases being rendered almost, if not altogether, imperceptible. Any other highly porous substance, such for instance as sponge platinum, or pounded pumice-stone, might probably be found to answer perfectly well for filling the respirator; but I have selected charcoal as the cheapest and most easily available material.

While the filtration of water through charcoal powder and other porous substances has been advantageously practiced for many centuries, the object in view being to deprive the water of numerous impurities diffused through it, which produce injurious effects on the animal economy, it is certainly somewhat remarkable that the very obvious application of a similar proceeding to the lighter fluid in which we live, viz. air, which not unfrequently contains even more noxious impurities floating in it than are usually present in water, should have, up to the present time, been so unaccountably overlooked.

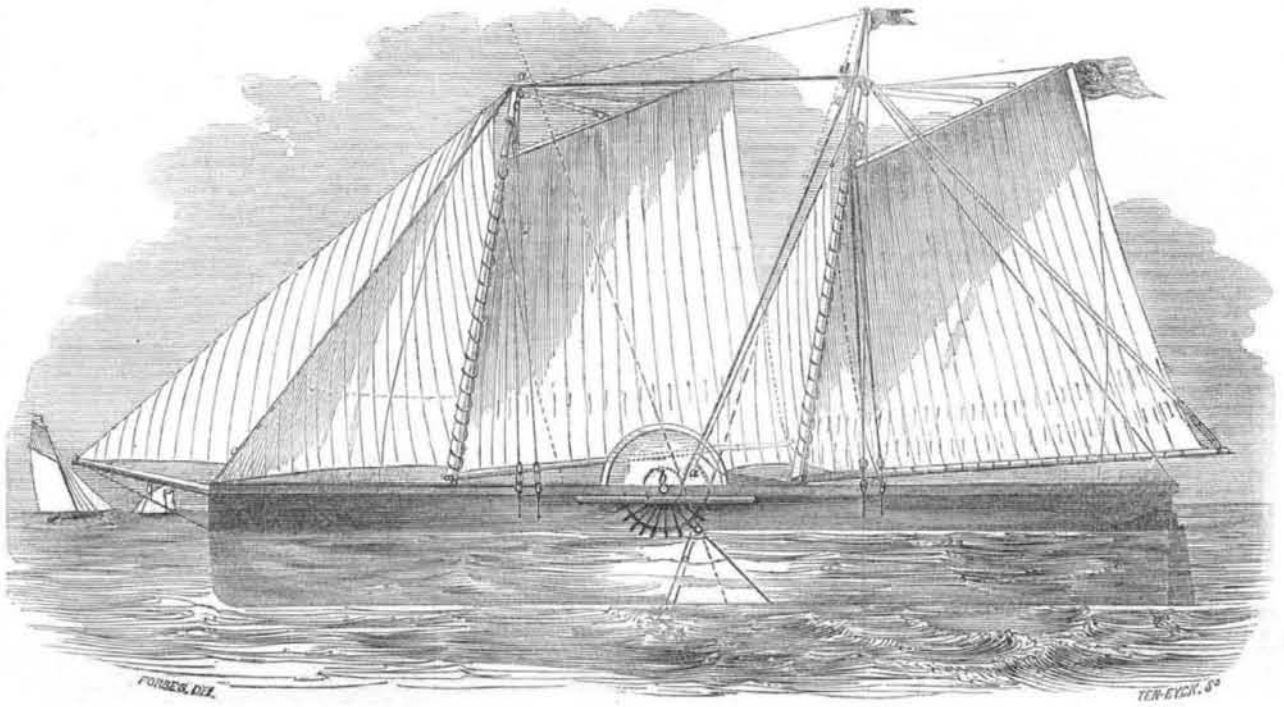
In addition to the precaution of wearing such a respirator as that just described, persons necessitated to live in especially pestiferous districts might have their houses made as air-tight as possible, with the exception of such openings as are necessary to maintain a proper amount of ventilation. By means of these openings the air could be freely admitted through gauze into which the requisite quantity of charcoal had been quilted. The doors of such houses could also be made double, and be constructed of coarse cloth, likewise containing a thin layer of charcoal powder. As an additional precaution, if it were thought desirable, the walls, floors, and ceilings of houses in very unhealthy districts could be easily lined with mattrasses filled with a couple of inches of charcoal powder. Were these and similar precautions adopted I confidently anticipate that Europeans will be enabled to reside with comparative impunity in some of the hitherto most pestilential districts of the world."

Oxyd of Copper.

The ordinary method of preparing this substance as it is used in organic analysis, is to heat the nitrate of the metal to ignition in a crucible; this is attended with much inconvenience, owing to the salt melting, frothing, and in general flowing over the sides of the vessel; in addition to which the crucible commonly cracks during the operation, and permits the liquid portion to run through into the fire. Now all this may be avoided by using a vessel of copper, which is easily made by any one, by simply taking a piece of sheet copper, and folding it so as to form a water-tight vessel, without the use of solder; every one by inspecting a common kitchen fire-shovel will render this intelligible.

In a vessel of this description the nitrate may be safely decomposed, and without any risk of overheating and fusing the oxyd; although the vessel gradually wears out in so doing, it yields a quantity of oxyd of copper, which is mixed along with that produced from the nitrate.

THE BENDER.



The readers of the "Scientific American, who take an interest in naval architecture, will be apt to remember an article in this paper under the title above written, in our issue of July 10, 1852.

The engraving now presented shows some modifications of that plan. It is here intended to gain a propelling power only from the falling of the fore and the aft sections, as the bender passes the crest of a wave, the foreship being allowed to rise over the wave it is encountering without having that motion taxed to produce any mechanical power. In other words, only one wire-rope, *a a*, is used, starting from the foot of the bowsprit, crossing the head of the foremast, passing around a pulley, *b*, on the head of the mainmast and thence down to the fusee on the paddle-wheel shaft, *b*. The motion of the shaft is to be sustained and made continuous by a suitable fly-wheel. As the fore-ship rises, the slack of the rope is to be taken up on the fusee (to be ready for the next pull) by the action of a weight or spring.

The hope is cherished that this Bender, whether in the form of a small boat for harbor use, or in a vessel of larger size, will demonstrate the practicability of using the wave power in moving against a head-wind.

George Steers, Esq., shipbuilder, at the Dry Dock, is ready to undertake the construction of such a vessel for any parties that may apply to him.

Communications for the inventor may be left with his agent in New York, John Livingston, Esq., Counsellor at Law, 157 Broadway.

Depositing of Aluminum and Silicium.

The following interesting extract is from the London "Artizan:"—

Mr. Gore, of Birmingham, has succeeded in depositing aluminum and silicium upon copper, by the electrotype process. To obtain the former, he boils an excess of dry hydrous alumina in hydrochloric acid for one hour, then, pouring off the clear liquid, adds one-sixth its volume of water. In this mixture was set an earthen porous vessel, containing sulphuric acid, diluted with 12 parts of water, and with a piece of amalgamated zinc plate in it. In the chloride of aluminum solution was immersed a plate of copper, of the same amount of immersed metallic surface as that of the zinc, and connected with the zinc by a copper wire. The whole was then set aside for some hours, and, when examined, the copper was found coated with a lead-colored deposit of aluminum, which, when burnished, possessed the same degree of whiteness as platinum, and did not readily tarnish either by immersion in cold water, or by the action of the atmosphere, but was acted on by sulphuric and nitric acids, whether concentrated or dilute. If the apparatus is kept quite warm, and a copper plate much smaller than the zinc plate is employed, the deposit appears in a very short time—sometimes in half-a-minute; if the chloride solution is not diluted with water, the deposit is equally, if not more rapid.

The author has also succeeded in obtaining a quick deposit of aluminum, in a less pure state, by dissolving common pipe-clay in boiling hydrochloric acid, and using the clear liquor undiluted in place of the above-mentioned chloride Similar deposits were obtained from a strong aqueous solution of acetate of alumina, and rom common alum, but more slowly. With each of the solutions named, the deposit was hastened by putting from one to three small Smee's batteries in the circuit.

To obtain the deposit of silicium, monosilicate of potash (prepared by melting together 1 part silica with 2¼ parts carbonate of potash), was dissolved in water, in the proportion of 40 grains to one ounce measure, proceeding as with aluminum, the process being hastened by interposing a Smee's battery in the circuit.—With a very slow and feeble action of the battery, the color of the deposited metal closely resembled that of silver.

Old Newspaper.

A valuable work has recently been added to the library of Congress—a complete file of the "London Gazette," from 1656 to the present time. This is the only complete file in existence. The Royal Library in Great Britain made several ineffectual attempts to obtain this work, but the prize was borne off by Brother Jonathan. The "Gazette" has been for 200 years the journal of the British government, and in it are published all civil, military, and naval appointments; resignations, deaths, and dismissals—all bankruptcies, proclamations, ordinances and despatches from military and naval officers in command on foreign stations.—[Exchange.

Submarine Navigation.

A Dr. Payerne, recently, at Marseilles, France, descended in a machine of his own invention, with three sailors, and after remaining under water a considerable length of time, climbed into the port-holes of a man-of-war in the harbor, without being perceived by the crew. It is said the machine will contain a four hours' supply of air for a crew of fourteen men.